

AMENDMENTS TO THE CLAIMS

Claims 1-14 (Canceled)

Claim 15 (Currently Amended): ~~The mutant acid phosphatase according to claim 10,~~
An isolated mutant acid phosphatase with improved nucleoside-5'-phosphate producing
ability relative to the wild type enzyme, wherein the enzyme is ~~derived from Enterobacter~~
~~aerogenes, and~~ has the amino acid sequence of ~~the enzyme includes replacement with another~~
~~amino acid residue of~~ SEQ ID NO: 125 wherein said amino acid sequence contains
substitution of at least one amino acid residue ~~among the 14th leucine residue, the 61st~~
~~leucine residue, the 63rd alanine residue, the 64th glutamic acid residue, the 67th asparagine~~
~~residue, the 69th serine residue, the 70th alanine residue, the 71st glycine residue, the 72nd~~
~~glycine residue, the 101st isoleucine residue, the 102nd glutamic acid residue, the 133rd~~
~~threonine residue, the 134th glutamic acid residue, the 138th leucine residue, 149th threonine~~
~~residue and the 151st isoleucine residue,~~ selected from the group consisting of Leu-14, Leu-
61, Ala-63, Glu-64, Asn-67, Ser-69, Ala-70, Gly-71, Gly-72, Ile-101, Glu-102, Thr-133, Glu-
134, Leu-138, Thr-149, and Ile-151, wherein said substitution comprises replacement of the
aforementioned amino acid residue(s) with any amino acid residue other than said
aforementioned amino acid residue(s).

Claim 16 (Currently Amended): ~~The mutant acid phosphatase according to claim 12,~~
~~wherein the enzyme is derived from Enterobacter aerogenes, and the enzyme has any one of~~
~~following amino acid replacements:~~ An isolated mutant acid phosphatase having an amino
acid sequence of SEQ ID NO: 125 which contains a series of replacements, wherein said
replacements are selected from the group consisting of:

(a) ~~mutation consisting of replacements of the 61st leucine residue~~ Leu-61 with a glutamine residue, ~~the 63rd alanine residue~~ Ala-63 with a glutamine residue, ~~the 64th glutamic acid residue~~ Glu-64 with an alanine residue, ~~the 67th asparagine residue~~ Asn-67 with an aspartic acid residue, ~~the 69th serine residue~~ Ser-69 with an alanine residue, ~~the 70th alanine residue~~ Ala-70 with a valine residue, ~~the 72nd glycine residue~~ Gly-72 with an aspartic acid residue, ~~the 102nd glutamic acid residue~~ Glu-102 with a leucine residue, ~~the 133rd threonine residue~~ Thr-133 with a lysine residue, ~~the 134th glutamic acid residue~~ Glu-134 with an aspartic acid residue, ~~the 149th threonine residue~~ Thr-149 with a serine residue and ~~the 151st isoleucine residue~~ Ile-151 with a serine residue;

(b) ~~mutation consisting of replacements of the 61st leucine residue~~ Leu-61 with a glutamine residue, ~~the 63rd alanine residue~~ Ala-63 with a glutamine residue, ~~the 64th glutamic acid residue~~ Glu-64 with an alanine residue, ~~the 67th asparagine residue~~ Asn-67 with an aspartic acid residue, ~~the 69th serine residue~~ Ser-69 with an alanine residue, ~~the 70th alanine residue~~ Ala-70 with a valine residue, ~~the 72nd glycine residue~~ Gly-72 with an aspartic acid residue, ~~the 133rd threonine residue~~ Thr-133 with a lysine residue, ~~the 134th glutamic acid residue~~ Glu-134 with an aspartic acid residue, ~~the 149th threonine residue~~ Thr-149 with a alanine residue and ~~the 151st isoleucine residue~~ Ile-151 with a serine residue;

(c) ~~mutation consisting of replacements of the 61st leucine residue~~ Leu-61 with a glutamine residue, ~~the 63rd alanine residue~~ Ala-63 with a glutamine residue, ~~the 64th glutamic acid residue~~ Glu-64 with an alanine residue, ~~the 67th asparagine residue~~ Asn-67 with an aspartic acid residue, ~~the 69th serine residue~~ Ser-69 with an alanine residue, ~~the 70th alanine residue~~ Ala-70 with a glutamic acid residue, ~~the 72nd glycine residue~~ Gly-72 with an aspartic acid residue, ~~the 133rd threonine residue~~ Thr-133 with a lysine residue, ~~the 134th~~

~~glutamic acid residue~~ Glu-134 with an aspartic acid residue, ~~the 149th threonine residue~~ Thr-149 with a glycine residue and ~~the 151st isoleucine residue~~ Ile-151 with a serine residue;

(d) ~~mutation consisting of replacements of the 61st leucine residue~~ Leu-61 with a glutamine residue, ~~the 63rd alanine residue~~ Ala-63 with a glutamine residue, ~~the 64th glutamic acid residue~~ Glu-64 with an alanine residue, ~~the 67th asparagine residue~~ Asn-67 with an aspartic acid residue, ~~the 69th serine residue~~ Ser-69 with an alanine residue, ~~the 70th alanine residue~~ Ala-70 with a lysine residue, ~~the 72nd glycine residue~~ Gly-72 with an aspartic acid residue, ~~the 133rd threonine residue~~ Thr-133 with a lysine residue, ~~the 134th glutamic acid residue~~ Glu-134 with an aspartic acid residue, ~~the 149th threonine residue~~ Thr-149 with a glycine residue and ~~the 151st isoleucine residue~~ Ile-151 with a serine residue; and

(e) ~~mutation consisting of replacements of the 61st leucine residue~~ Leu-61 with a glutamine residue, ~~the 63rd alanine residue~~ Ala-63 with a glutamine residue, ~~the 64th glutamic acid residue~~ Glu-64 with an alanine residue, ~~the 67th asparagine residue~~ Asn-67 with an aspartic acid residue, ~~the 69th serine residue~~ Ser-69 with an alanine residue, ~~the 70th alanine residue~~ Ala-70 with a methionine residue, ~~the 72nd glycine residue~~ Gly-72 with an aspartic acid residue, ~~the 102nd glutamic acid residue~~ Glu-102 with a glutamine residue, ~~the 133rd threonine residue~~ Thr-133 with a lysine residue, ~~the 134th glutamic acid residue~~ Glu-134 with an aspartic acid residue, ~~the 149th threonine residue~~ Thr-149 with a serine residue and ~~the 151st isoleucine residue~~ Ile-151 with a serine residue.

Claim 17 (Canceled)

Claim 18 (Withdrawn): A method for producing an inhibitor for a phosphatase or transphosphorylation enzyme, which utilizes structure coordinates of the acid phosphatase derived from *Escherichia blattae*.

Claim 19 (Canceled)

Claim 20 (Currently Amended): A crystal of an acid phosphatase derived from *Escherichia blattae* having an amino acid sequence of SEQ ID NO: 124, which has a space group P6322 of a hexagonal system.

Claim 21 (Currently Amended): A crystal of a mutant enzyme acid phosphatase C74D/I153T derived from *Escherichia blattae* having an amino acid sequence of SEQ ID NO: 124, wherein the Gly-74 is replaced with an aspartic acid residue and Ile-153 is replaced with a serine residue, which has a space group P212121 of a rhombic system.

Claim 22 (Currently Amended): A crystal of complex of an acid phosphatase derived from *Escherichia blattae* having an amino acid sequence of SEQ ID NO: 124 and molybdate (~~reaction intermediate analogue~~), which has a space group P3121 of a trigonal system.

Claim 23 (Currently Amended): A gene coding for ~~any one of the enzymes~~ a mutant acid phosphatase according to any one of claims 1-16 claim 15.

Claim 24 (Original): A recombinant DNA, which contains the gene according to claim 23.

Claim 25 (Currently Amended): A microorganism, ~~which is introduced with~~
comprising the gene according to claim 23 or the recombinant DNA according to claim 24.

Claim 26 (Currently Amended): A method for producing a nucleoside-5'-phosphate,
which comprises:

~~allowing the enzyme~~ reacting a nucleoside and a phosphate donor with a mutant acid
phosphatase according to any one of claims 1-16 claim 15, a microorganism containing it or
~~the microorganism according to claim 25 to act on a nucleoside and a phosphate donor to~~
produce nucleoside-5'-phosphate and
collecting the nucleoside-5'-phosphate it.

Claim 27 (Currently Amended): The method according to claim 26, wherein ~~the~~
~~enzyme, the microorganism containing it or the microorganism according to claim 25 is~~
~~allowed to act on a nucleoside and a phosphate donor under a condition of~~ said reacting is at a
pH ranging from 3.0-5.5.

Claim 28 (New): A method for producing a nucleoside-5'-phosphate, which
comprises:
reacting a nucleoside and a phosphate donor with a microorganism according to claim
25 to produce nucleoside-5'-phosphate and
collecting the nucleoside-5'-phosphate.

Claim 29 (New): The method according to claim 28, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 30 (New): A microorganism comprising the recombinant DNA according to claim 24.

Claim 31 (New): A method for producing a nucleoside-5'-phosphate, which comprises:
reacting a nucleoside and a phosphate donor with a microorganism according to claim 30 to produce nucleoside-5'-phosphate and
collecting the nucleoside-5'-phosphate.

Claim 32 (New): The method according to claim 31, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 33 (New): A method for producing a nucleoside-5'-phosphate, which comprises:
reacting a nucleoside and a phosphate donor with a mutant acid phosphatase according to claim 16 to produce nucleoside-5'-phosphate and
collecting the nucleoside-5'-phosphate.

Claim 34 (New): The method according to claim 33, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 35 (New): A gene coding for a mutant acid phosphatase according to claim 16.

Claim 36 (New): A microorganism comprising the gene according to claim 29.

Claim 37 (New): A method for producing a nucleoside-5'-phosphate, which comprises:

reacting a nucleoside and a phosphate donor with a microorganism according to claim 25 to produce nucleoside-5'-phosphate and
collecting the nucleoside-5'-phosphate.

Claim 38 (New): The method according to claim 37, wherein said reacting is at a pH ranging from 3.0-5.5.

Claim 39 (New): A recombinant DNA, which contains the gene according to claim 35.

Claim 40 (New): A microorganism comprising the recombinant DNA according to claim 39.

Claim 41 (New): A method for producing a nucleoside-5'-phosphate, which comprises:

reacting a nucleoside and a phosphate donor with a microorganism according to claim 25 to produce nucleoside-5'-phosphate and
collecting the nucleoside-5'-phosphate.

Claim 42 (New): The method according to claim 41, wherein said reacting is at a pH ranging from 3.0-5.5.

SUPPORT FOR THE AMENDMENTS

Claims 1-14, 17, and 19 have been canceled.

Claims 15, 16, 20-23, and 25-27 have been amended.

Claims 28-42 have been added.

The amendment to Claims 15, 16, 20-23, and 25-27 and new Claims 28-42 are supported by Claims 1-27 as originally filed. Further support for the amendment to Claims 15, 16, 20-23, and 25-27 and new Claims 28-42 is provided by the specification as originally filed, for example at pages 4-30 and Figures 2 and 9.

No new matter has been added by the present amendment.